

CLAIMS

Therefore, having thus described the invention, at least the following is claimed:

- 1 1. A method of providing functional magnetic resonance imaging data analysis
2 services, comprising:
3 receiving from a client via a communications network a data set containing
4 information related to a functional magnetic resonance image of an individual's brain;
5 identifying a plurality of spatially independent components related to the data set
6 by applying a blind source separation algorithm to the data set; and
7 delivering to the client via a communications network information related to the
8 plurality of independent components of the data set.
- 1 2. The method of claim 1, further comprising reducing the dimensionality of the data
2 set by applying a singular value decomposition algorithm to the data set prior to
3 identifying spatially independent components of the data set.
- 1 3. The method of claim 1, further comprising charging the client for delivering the
2 independent components of the data set.

1 4. The method of claim 1, wherein the receiving from a client and the delivering to
2 the client is via the Internet and the client views the information related to the plurality of
3 independent components of the data set with a web browser.

1 5. The method of claim 1, further comprising storing the plurality of independent
2 components in a database containing information related to a plurality of sets of other
3 independent components, each set of other independent components corresponding to
4 another data set related to a distinct functional magnetic resonance image of another
5 individual's brain.

1 6. The method of claim 1, further comprising receiving a request from the client via
2 the communications network to compare the plurality of independent components to the
3 plurality of sets of other independent components in the database.

1 7. The method of claim 6, further comprising (i) comparing the plurality of
2 independent components to the plurality of sets of independent components in the
3 database and (ii) delivering to the client via the communications network information
4 based on the comparison.

1 8. The method of claim 7, further comprising charging the client for delivering the
2 information based on the comparison.

1 9. A method of developing a functional magnetic resonance image database
2 containing information related to a plurality of data sets, each of the plurality of data sets
3 corresponding to a different functional magnetic resonance image, comprising:
4 offering functional magnetic resonance imaging data analysis services, the
5 services comprising (i) enabling a client to transmit via a communications network a
6 client data set, the client data set containing information related to a functional magnetic
7 resonance image, (ii) identifying a plurality of spatially independent components related
8 to the client data set by applying a blind source separation algorithm to the data set, and
9 (iii) delivering to the client via the communications network information related to the
10 plurality of independent components related to the client data set;
11 receiving a plurality of client data sets from a plurality of clients via the
12 communications network; and
13 providing the functional magnetic resonance imaging data analysis services to the
14 plurality of clients.

1 10. The method of claim 9, further comprising storing the plurality of sets of
2 independent components corresponding to the plurality of clients in the database.

1 11. The method of claim 10, further comprising comparing each of the plurality of
2 sets of independent components to the other of the plurality of sets of independent
3 components.

1 12. The method of claim 11, further comprising identifying common components
2 which exist in a scientifically-significant portion of the plurality of sets of independent
3 components.

1 13. The method of claim 9, wherein the services further comprise reducing the
2 dimensionality of the client data set by applying a singular value decomposition algorithm
3 to the client data set prior to identifying a plurality of spatially independent components
4 related to the client data set.

1 14. The method of claim 9, further comprising charging the plurality of clients for the
2 services.

1 15. The method of claim 9, wherein the communications network is the Internet and
2 the plurality of clients view the information related to the plurality of independent
3 components of the data set with a web browser.

1 16. A method of providing functional magnetic resonance imaging comparison
2 services, comprising:
3 receiving from a client via a communications network a client data set containing
4 information related to a functional magnetic resonance image;
5 identifying a plurality of spatially independent components related to the client
6 data set by applying a blind source separation algorithm to the client data set; and
7 receiving from the client a request to compare the plurality of independent
8 components to a set of fundamental independent components in a database, the set of
9 fundamental independent components comprising common components which exist in a
10 scientifically-significant portion of a plurality of sets of independent components
11 corresponding to a plurality of functional magnetic resonance image data sets contained
12 in the database.

1 17. The method of claim 16, further comprising comparing the plurality of
2 independent components related to the client data set to the set of fundamental
3 independent components in the database.

1 18. The method of claim 17, further comprising delivering to the client information
2 based on the comparison via the communications network.

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1 19. The method of claim 16, further comprising reducing the dimensionality of the
2 client data set by applying a singular value decomposition algorithm to the client data set
3 prior to identifying spatially independent components of the client data set.

1 20. The method of claim 18, further comprising charging the client for delivering the
2 information based on the comparison.

1 21. The method of claim 18, wherein the receiving from a client and the delivering to
2 the client is via the Internet and the client views the information with a web browser.

1 22. The method of claim 16, further comprising modifying the set of fundamental
2 independent components in the database based on the plurality of independent
3 components related to the client data set.

1 23. A system for providing functional magnetic resonance imaging data analysis
2 services, comprising:

3 a means for receiving from a client via a communications network a data set
4 containing information related to a functional magnetic resonance image of an
5 individual's brain;

6 a means for identifying a plurality of spatially independent components related to
7 the data set by applying a blind source separation algorithm to the data set; and
8 a means for delivering to the client via a communications network information
9 related to the plurality of independent components of the data set.

1 24. The system of claim 23, further comprising a means for reducing the
2 dimensionality of the data set by applying a singular value decomposition algorithm to the
3 data set prior to identifying spatially independent components of the data set.

1 25. The system of claim 23, further comprising a means for charging the client for
2 delivering the information related to the plurality of independent components related to
3 the data set.

1 26. The system of claim 23, wherein the communications network is the Internet and
2 the client views the information related to the plurality of independent components
3 related to the data set with a web browser.

1 27. The system of claim 23, further comprising a means for storing the plurality of
2 independent components.

1 28. The system of claim 23, further comprising a means for receiving a request from
2 the client via the communications network to compare the plurality of independent
3 components to information related to a plurality of sets of other independent components,
4 each set of other independent components corresponding to another data set related to a
5 distinct functional magnetic resonance image.

1 29. The system of claim 28, further comprising a means for comparing the plurality of
2 independent components to the plurality of sets of independent components in the
3 database and a means for delivering to the client via the communications network
4 information based on the comparison.

1 30. The system of claim 29, further comprising a means for charging the client for
2 delivering the information based on the comparison.

1 31. A system for developing a functional magnetic resonance image database
2 containing information related to a plurality of data sets, each of the plurality of data sets
3 corresponding to a different functional magnetic resonance image, comprising:
4 a means for offering functional magnetic resonance imaging data analysis
5 services, the services comprising (i) enabling a client to transmit via a communications
6 network a client data set, the client data set containing information related to a functional

7 magnetic resonance image, (ii) identifying a plurality of spatially independent
8 components related to the client data set by applying a blind source separation algorithm
9 to the data set, and (iii) delivering to the client via the communications network
10 information related to the plurality of independent components related to the client data
11 set;

12 a means for receiving a plurality of client data sets from a plurality of clients via
13 the communications network; and

14 a means for providing the functional magnetic resonance imaging data analysis
15 services to the plurality of clients.

1 32. The system of claim 31, further comprising a means for storing the plurality of
2 sets of independent components corresponding to the plurality of clients in the database.

1 33. The system of claim 32, further comprising a means for comparing each of the
2 plurality of sets of independent components to the other of the plurality of sets of
3 independent components.

1 34. The system of claim 33, further comprising a means for identifying common
2 components which exist in a scientifically-significant portion of the plurality of sets of
3 independent components.

1 35. The system of claim 31, wherein the services further comprise reducing the
2 dimensionality of the client data set by applying a singular value decomposition algorithm
3 to the client data set prior to identifying a plurality of spatially independent components
4 related to the client data set.

1 36. The system of claim 31, further comprising a means for charging the plurality of
2 clients for the services.

1 37. The system of claim 31, wherein the communications network is the Internet and
2 the plurality of clients view the information related to the plurality of independent
3 components with a web browser.

1 38. A system for providing functional magnetic resonance imaging data comparison
2 services, comprising:
3 a means for receiving from a client via a communications network a client data set
4 containing information related to a functional magnetic resonance image;
5 a means for identifying a plurality of spatially independent components related to
6 the client data set by applying a blind source separation algorithm to the client data set;
7 and

8 a means for receiving from the client a request to compare the plurality of
9 independent components to a set of fundamental independent components in a database,
10 the set of fundamental independent components comprising common components which
11 exist in a scientifically-significant portion of a plurality of sets of independent
12 components corresponding to a plurality of functional magnetic resonance image data sets
13 contained in the database.

1 39. The system of claim 38, further comprising a means for comparing the plurality of
2 independent components related to the client data set to the set of fundamental
3 independent components in the database.

1 40. The system of claim 39, further comprising a means for delivering to the client
2 information based on the comparison via the communications network.

1 41. The system of claim 38, further comprising a means for reducing the
2 dimensionality of the client data set by applying a singular value decomposition algorithm
3 to the client data set prior to identifying spatially independent components of the client
4 data set.

1 42. The system of claim 40, further comprising a means for charging the client for
2 delivering the information based on the comparison.

1 43. The system of claim 40, wherein the communications network is the Internet and
2 the client views the information with a web browser.

1 44. The system of claim 39, wherein the set of fundamental independent components
2 in the database is modified based on the plurality of independent components related to
3 the client data set.

1 45. A system for providing functional magnetic resonance imaging data analysis
2 services, comprising:
3 an interface adapted to receive from a client via a communications network a data
4 set containing information related to a functional magnetic resonance image of an
5 individual's brain and adapted to deliver to the client information related to a plurality of
6 spatially independent components related to the data set; and
7 a processing engine programmed to identify a plurality of spatially independent
8 components related to the data set by applying a blind source separation algorithm to the
9 data set.

1 46. The system of claim 45, wherein the processing engine is further programmed to
2 reduce the dimensionality of the data set by applying a singular value decomposition
3 algorithm to the data set prior to identifying a plurality of spatially independent
4 components.

1 47. The system of claim 46, further comprising a billing functionality coupled to the
2 interface for charging the client for delivering the independent components of the data set.

1 48. The system of claim 46, wherein the communications network is the Internet and
2 the interface is a web server.

1 49. The system of claim 46, further comprising a database for storing the plurality of
2 independent components.

1 50. The system of claim 46, wherein the interface is further adapted to receive a
2 request from the client via the communications network to compare the plurality of
3 independent components to information related to a plurality of sets of other independent
4 components stored in the database, each set of other independent components
5 corresponding to another data set related to a distinct functional magnetic resonance
6 image.

1 51. The system of claim 50, wherein the processing engine is further programmed to
2 compare the plurality of independent components to the plurality of sets of independent
3 components in the database and the interface is further adapted to deliver to the client via
4 the communications network information based on the comparison.

1 52. The system of claim 51, further comprising a billing functionality coupled to the
2 interface for charging the client for delivering the information based on the comparison.

1 53. A system for providing functional magnetic resonance imaging data analysis and
2 comparison services, comprising:

3 an interface adapted to receive from a client via a communications network a
4 client data set containing information related to a functional magnetic resonance image;
5 a processing engine programmed to identify a plurality of spatially independent
6 components related to the client data set by applying a blind source separation algorithm
7 to the client data set; and

8 a searchable database containing information related to (i) a plurality of sets of
9 independent components corresponding to a plurality of functional magnetic resonance
10 image data sets and (ii) a set of fundamental independent components comprising
11 common independent components which exist in a scientifically-significant portion of the
12 plurality of sets of independent components.

1 54. The system of claim 53, further comprising a functional magnetic resonance
2 image comparison engine programmed to compare the plurality of independent
3 components related to the client data set to the set of fundamental independent
4 components in the database.

1 55. The system of claim 54, wherein the interface is coupled to the comparison engine
2 and is adapted to deliver to the client information based on the comparison via the
3 communications network.

1 56. The system of claim 53, wherein the processing engine is further programmed to
2 reduce the dimensionality of the client data set by applying a singular value
3 decomposition algorithm to the client data set prior to identifying spatially independent
4 components of the client data set.

1 57. The system of claim 55, further comprising a billing functionality coupled to the
2 interface for charging the client for delivering the information based on the comparison.

1 58. The system of claim 55, wherein the communications network is the Internet and
2 the interface is a web server.

1 59. The system of claim 53, wherein the set of fundamental independent components
2 in the database is modified based on the plurality of independent components related to
3 the client data set.

1 60. A computer-readable medium for use by a computer for providing functional
2 magnetic resonance imaging data analysis services, comprising:
3 a first portion of code for receiving from a client via a communications network a
4 data set containing information related to a functional magnetic resonance image of an
5 individual's brain;
6 a second portion of code for identifying a plurality of spatially independent
7 components related to the data set by applying a blind source separation algorithm to the
8 data set; and
9 a third portion of code for delivering to the client via a communications network
10 information related to the plurality of independent components of the data set.

1 61. The computer-readable medium of claim 60, further comprising a fourth portion
2 of code for reducing the dimensionality of the data set by applying a singular value
3 decomposition algorithm to the data set prior to identifying spatially independent
4 components of the data set.

1 62. The computer-readable medium of claim 60, further comprising a fourth portion
2 of code for charging the client for delivering the independent components of the data set.

1 63. The computer-readable medium of claim 60, wherein receiving from the client
2 and delivering to the client is via the Internet and the client views the information related
3 to the plurality of independent components of the data set with a web browser.

1 64. The computer-readable medium of claim 60, further comprising a fourth portion
2 of code for storing the plurality of independent components in a database containing
3 information related to a plurality of sets of other independent components, each set of
4 other independent components corresponding to another data set related to a distinct
5 functional magnetic resonance image of another individual's brain.

1 65. The method of claim 60, further comprising a fourth portion of code for receiving
2 a request from the client via the communications network to compare the plurality of
3 independent components to the plurality of sets of other independent components in the
4 database.

1 66. The computer-readable medium of claim 65, further comprising a fifth portion of
2 code for (i) comparing the plurality of independent components to the plurality of sets of

3 independent components in the database and (ii) delivering to the client via the
4 communications network information based on the comparison.

1 67. The computer-readable medium of claim 66, further comprising a sixth portion of
2 code for charging the client for delivering the information based on the comparison.

1 68. A computer-readable medium for use by a computer for providing functional
2 magnetic resonance imaging comparison services, comprising:
3 a first portion of code for receiving from a client via a communications network a
4 client data set containing information related to a functional magnetic resonance image;
5 a second portion of code for identifying a plurality of spatially independent
6 components related to the client data set by applying a blind source separation algorithm
7 to the client data set; and
8 a third portion of code for receiving from the client a request to compare the
9 plurality of independent components to a set of fundamental independent components in a
10 database, the set of fundamental independent components comprising common
11 components which exist in a scientifically-significant portion of a plurality of sets of
12 independent components corresponding to a plurality of functional magnetic resonance
13 image data sets contained in the database.

1 69. The computer-readable medium of claim 68, further comprising a fourth portion
2 of code for comparing the plurality of independent components related to the client data
3 set to the set of fundamental independent components in the database.

1 70. The computer-readable medium of claim 69, further comprising a fifth portion of
2 code for delivering to the client information based on the comparison via the
3 communications network.

1 71. The computer-readable medium of claim 68, further comprising a fourth portion
2 of code for reducing the dimensionality of the client data set by applying a singular value
3 decomposition algorithm to the client data set prior to identifying spatially independent
4 components of the client data set.

1 72. The method of claim 70, further comprising a sixth portion of code for charging
2 the client for delivering the information based on the comparison.

1 73. The computer-readable medium of claim 70, wherein receiving from a client and
2 delivering to the client is via the Internet and the client views the information with a web
3 browser.

- 1 74. The computer-readable medium of claim 69, further comprising a fifth portion of
- 2 code for modifying the set of fundamental independent components in the database based
- 3 on the plurality of independent components related to the client data set.